CLAIMS

I claim:

1. A temperature compensation valve comprising:

an enclosure having an inlet and an outlet;

an orifice allowing for communication between the inlet and the outlet; and

a means for varying said orifice size to allow for a defined flow rate with fluctuations in temperature.

2. The temperature compensation valve of Claim 1 further comprising a piston positioned across the inlet to modulate flow rate as a function of temperature.

3. The temperature compensation valve of Claim 2 wherein said piston further comprises a first side and a second side, wherein said first side of said piston is adjacent to a puck, and said second side of said piston is adjacent to a biasing means.

4. The temperature compensation valve of Claim 3 wherein said biasing means is a spring.

5. The temperature compensation valve of Claim 3 wherein said second side of said piston further comprises a flanged end for retaining said biasing means.

6. The temperature compensation valve of claim 3 wherein said puck expands as temperature increases thereby urging said piston toward said orifice.

7. The temperature compensation valve of claim 3 wherein said biasing means urges said piston away from said orifice.

8. The temperature compensation valve of claim 3 wherein said puck is a comprised of a material with a temperature expansion coefficient different than the housing material temperature expansion coefficient.

9. The temperature compensation valve of claim 2 wherein said piston further comprises a pair of annular grooves, wherein each of said annular grove has an o-ring seated within.

10. The temperature compensation valve of claim 3 further comprising a fine tuning adjuster.

11. The temperature compensation valve of claim 10 wherein said fine tuning adjuster comprises a threaded nut and a threaded fitting wherein

advancing said threaded nut into said threaded fitting urges said puck toward said piston to thereby reduce the size of said orifice.

12. The temperature compensation valve of claim 3 further comprising a position measurement rod.

13. The temperature compensation valve of claim 12 wherein said position measurement rod further comprises:

a center rod and an end knob;

said center rod having a first side and a second side, wherein said first end of said center rod is in communication with said piston and said second end of said center rod is in communication with said end knob; and

said end protrudes from said valve to provide a visual indication of the position of said piston.

14. The temperature compensation valve of claim 13 wherein said center rod is substantially surrounded by said biasing means.

15. A pneumatic control system comprising:

a source of gas, a temperature compensation valve, and an actuator;

said temperature compensation valve further comprises an enclosure having an inlet and an outlet, an orifice allowing for communication between the

inlet and the outlet; and a means for varying said orifice size to allow for a constant flow rate with fluctuations in temperature.

16. The pneumatic control system of Claim 15, wherein said temperature compensation valve further comprises a piston positioned across the inlet to modulate flow rate as a function of temperature.

17. The pneumatic control system of Claim 16 wherein said piston further comprises a first side and a second side, wherein said first side of said piston is adjacent to a puck, and said second side of said piston is adjacent to a biasing means.

18. The pneumatic control system of Claim 17 wherein said biasing means is a spring.

19. The pneumatic control system of Claim 17 wherein said second side of said piston further comprises a flanged end for retaining said biasing means.

20. The pneumatic control system of claim 17 wherein said puck expands as temperature increases thereby urging said piston toward said orifice.

21. The pneumatic control system of claim 17 wherein said biasing means urges said piston away from said orifice.

22. The pneumatic control system of claim 17 wherein said puck is a comprised of a material with a temperature expansion coefficient different than the housing material temperature expansion coefficient.

23. The pneumatic control system of claim 16 wherein said piston further comprises a pair of annular grooves, wherein each of said annular grove has an o-ring seated within.

24. The pneumatic control system of claim 17 further comprising a fine tuning adjuster.

25. The pneumatic control system of claim 24 wherein said fine tuning adjuster comprises a threaded nut and a threaded fitting wherein advancing said threaded nut into said threaded fitting urges said puck toward said piston to thereby reduce the size of said orifice.

26. The pneumatic control system of claim 17 further comprising a position measurement rod.

27. The pneumatic control system of claim 26 wherein said position measurement rod further comprises:

a center rod and an end knob;

said center rod having a first side and a second side, wherein said first end of said center rod is in communication with said piston and said second end of said center rod is in communication with said end knob; and

said end protrudes from said valve to provide a visual indication of the position of said piston.

28. The pneumatic control system of claim 27 wherein said center rod is substantially surrounded by said biasing means.

29. A method of compensating for fluctuations in temperature for a pressure regulator comprising a diaphragm or piston positioned in series with a spring and a puck, comprising the steps of:

determining the change in spring force due to temperature;

determining the coefficient of expansion of a puck;

selecting a puck length such that said length multiplied by said coefficient of expansion and multiplied by said spring rate is equal to said change in spring force due to temperature wherein said strength of said spring is substantially constant; thereby

assuring that the pressure in said regulator remains substantially unchanged due to fluctuations in temperature.